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**Guider**

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(54) **CONVEYOR SYSTEM**

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This patent is subject to a terminal disclaimer.

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(22) Filed: **Feb. 9, 2015**

**Related U.S. Application Data**

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(51) **Int. Cl.**

| | |
|---|---|
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| ***B65G 37/00*** | (2006.01) |
| ***B65G 13/00*** | (2006.01) |
| ***B65G 39/07*** | (2006.01) |
| ***B65G 67/08*** | (2006.01) |

(52) **U.S. Cl.**
CPC ..... ***B65G 37/00*** (2013.01); ***B65G 13/00*** (2013.01); ***B65G 39/07*** (2013.01); ***B65G 47/883*** (2013.01); ***B65G 67/08*** (2013.01)

(58) **Field of Classification Search**
CPC .... B65G 39/07; B65G 67/08; B65G 47/883; B65G 47/8807
USPC ..... 198/419.1, 343.1; 414/331.17
See application file for complete search history.

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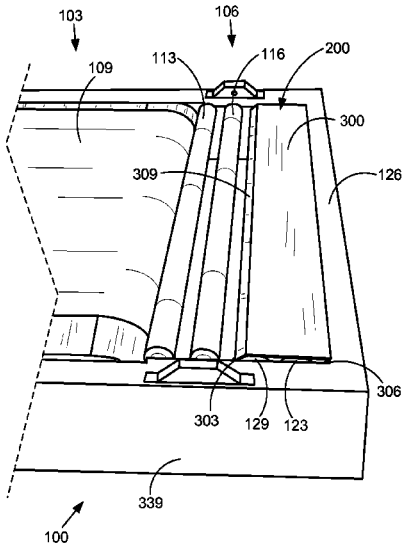
(57) **ABSTRACT**

Disclosed are various embodiments for a roller cover that can be installed in a conveyor system that includes a conveyor. The roller cover is positioned over a passive roller of the conveyor system. The conveyor transports the item. The speed of the item is reduced using the roller cover.

**20 Claims, 4 Drawing Sheets**



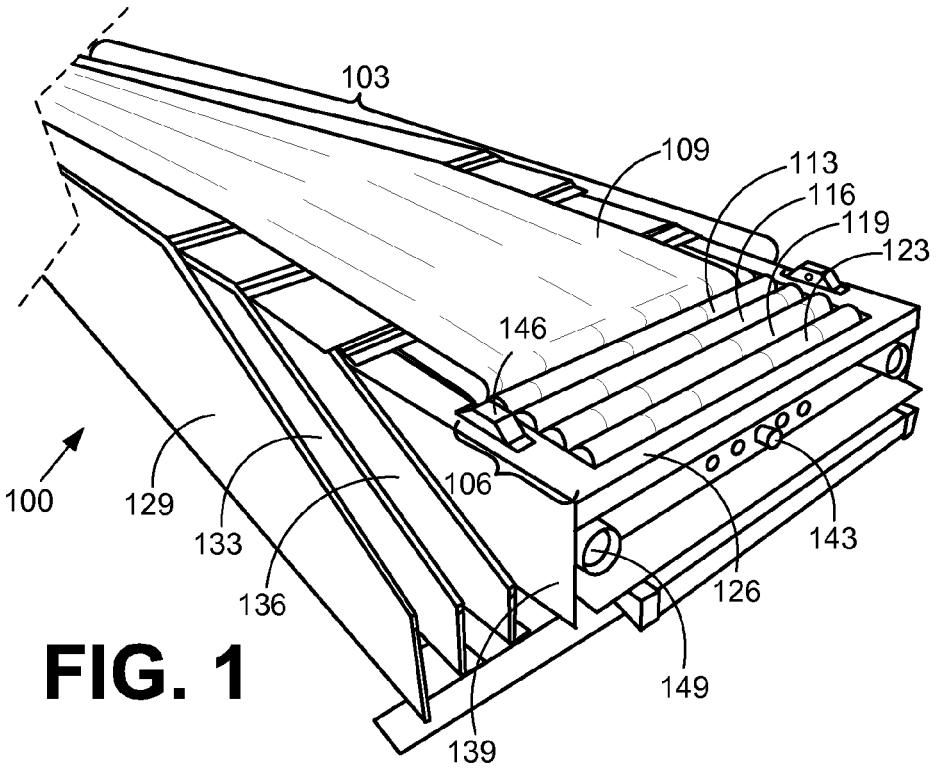

103
109
113
116
119
123
146
100
129
133
136
106
143
126
149
139

FIG. 1

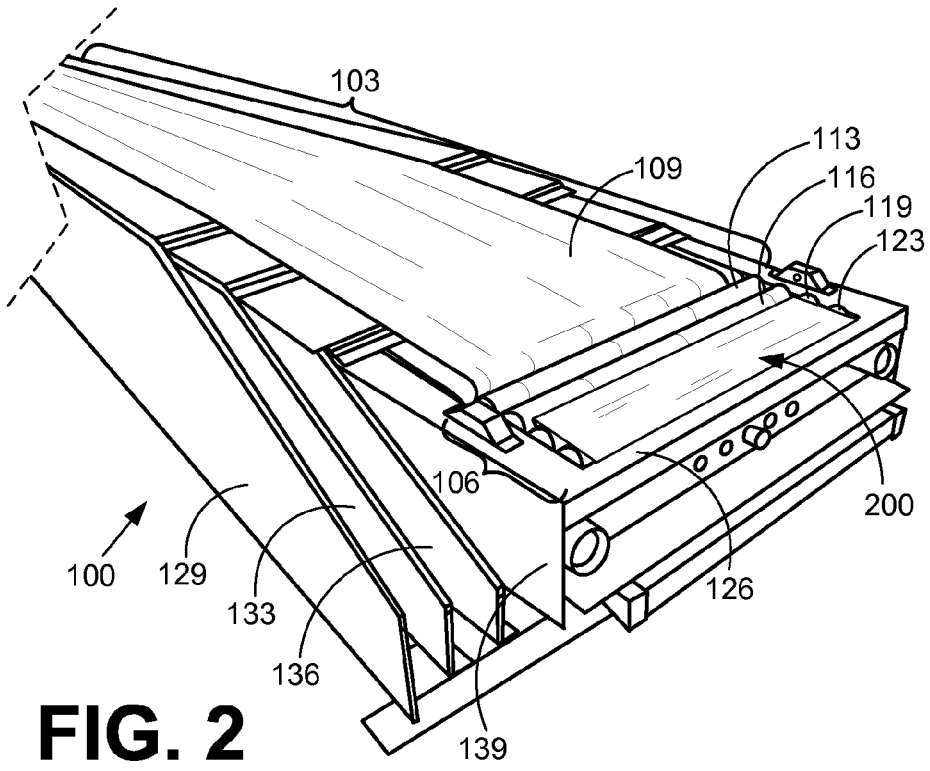

103
109
113
116
119
123
106
200
100
129
133
136
126
139

FIG. 2

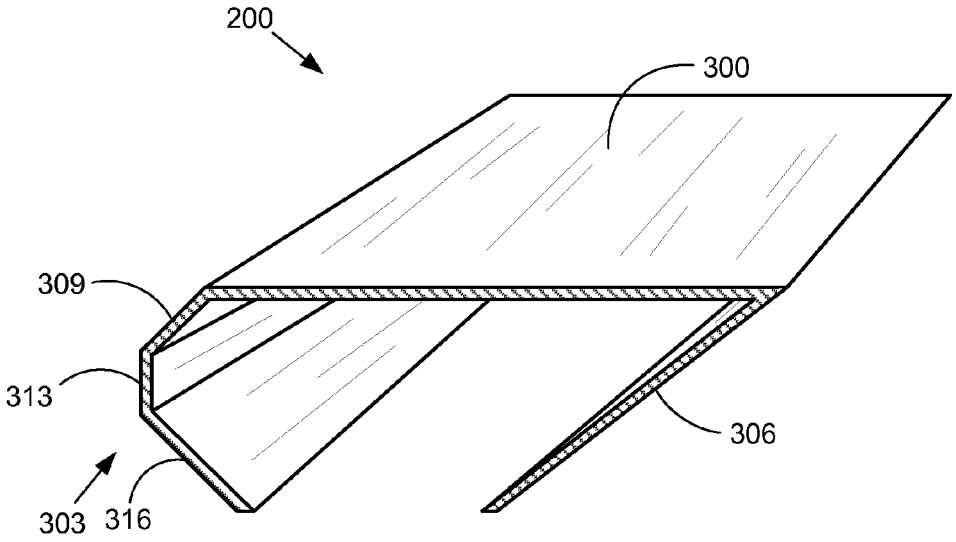

200
300
309
313
306
303
316

FIG. 3

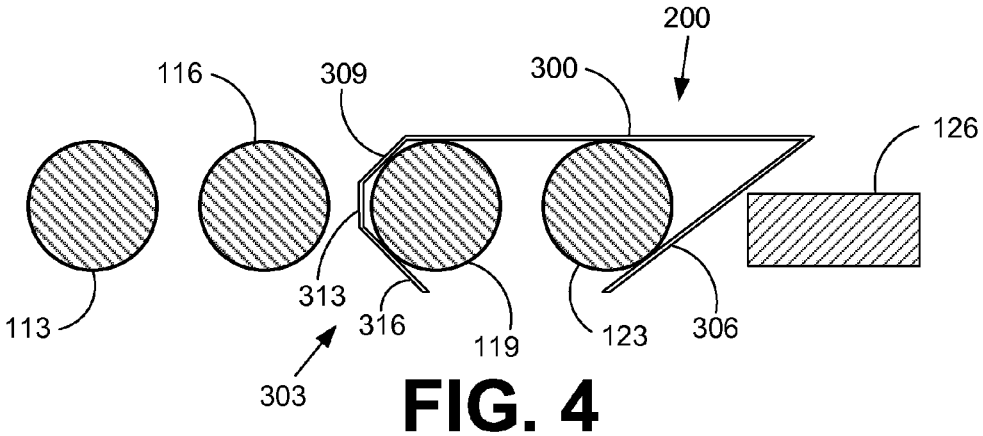

200
116
309
300
126
313
316
119
123
306
113
303

FIG. 4

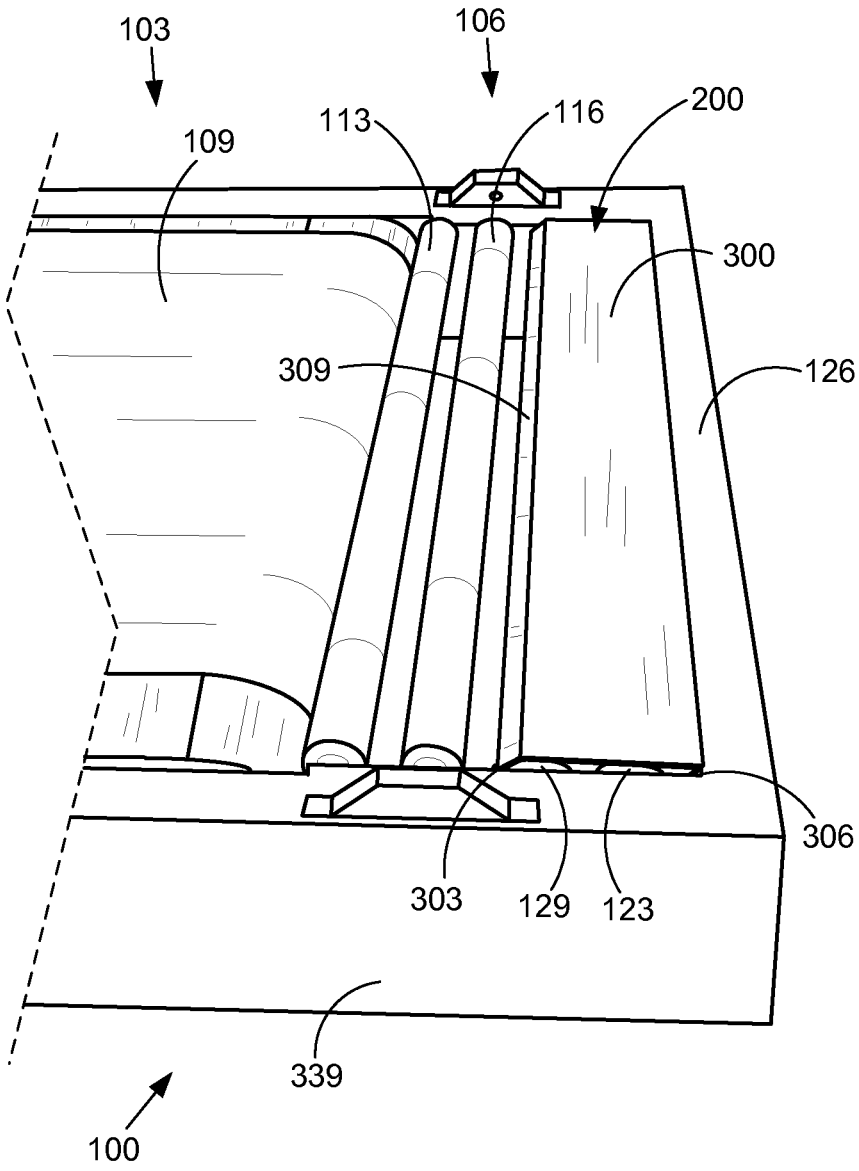



FIG. 5

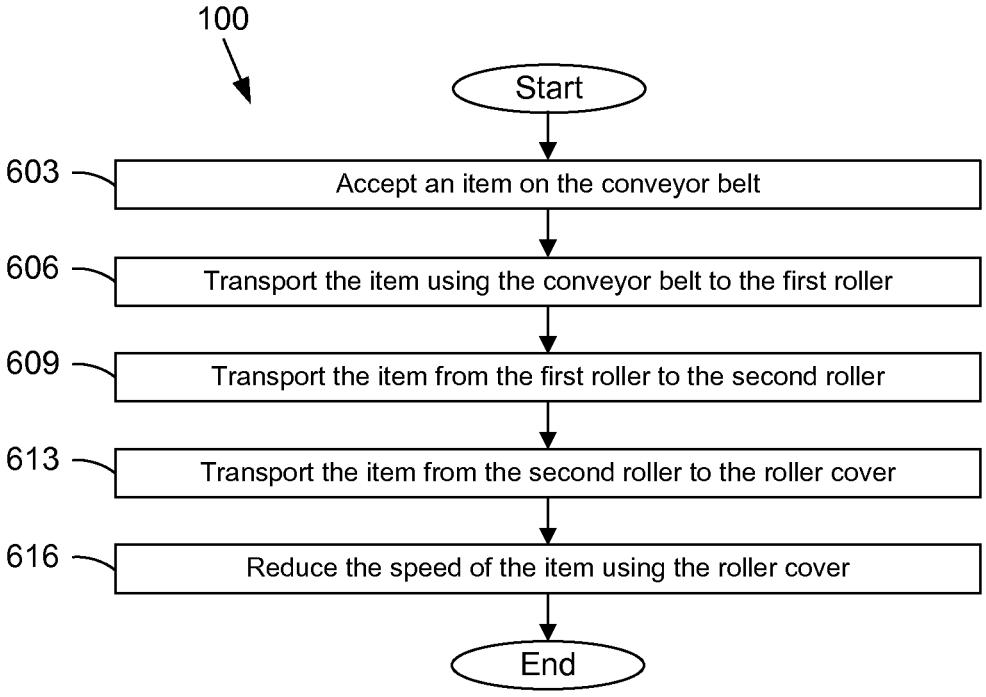

100
Start
603
Accept an item on the conveyor belt
606
Transport the item using the conveyor belt to the first roller
609
Transport the item from the first roller to the second roller
613
Transport the item from the second roller to the roller cover
616
Reduce the speed of the item using the roller cover
End

FIG. 6

# CONVEYOR SYSTEM

## CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of and claims priority to U.S. patent application Ser. No. 13/899,865, titled "Conveyor System," and filed on May 22, 2013, which is incorporated herein by reference in its entirety.

## BACKGROUND

An item can be loaded into a truck and shipped to a fulfillment center. Upon arrival of the item at a receiving area of the fulfillment center, the item is unloaded from the truck and entered into the fulfillment center for storage. A conveyor system can be used to move the item from the truck and into the fulfillment center. Additionally, one or more conveyor systems can be used to move the item within the fulfillment center. Upon the item being sold, for example, workers at the fulfillment center may prepare the item to be shipped to a recipient. For example, the item can be placed into a suitable shipping container, such as a cardboard box, and then loaded onto another truck that delivers the item to the recipient of the sale. A conveyor system can also be used to load the outgoing item into the truck.

## BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the present disclosure can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the disclosure. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIGS. **1-2** are drawings of examples of a conveyor system according to various embodiments of the present disclosure.

FIGS. **3-4** are drawings of an example of a roller cover for the conveyor system of FIGS. **1-2** according to various embodiments of the present disclosure.

FIG. **5** is another drawing of the conveyor system of FIGS. **1-2** according to various embodiments of the present disclosure.

FIG. **6** is a flowchart illustrating an example of functionality implemented by the conveyor system of FIGS. **1-2** according to various embodiments of the present disclosure.

## DETAILED DESCRIPTION

The present disclosure relates to a conveyor system that facilitates the movement of items carried by the conveyor system. As a non-limiting example, a conveyor system may be used in the loading dock of a fulfillment center to transport items from the loading dock to a truck. For example, an item can be placed on a conveyor that moves the item towards the destination end of the conveyor system. At the destination end of the conveyor system, there may be passive rollers, where the item can rest prior to the item being manually loaded into the truck.

However, an item riding on the conveyor can gain sufficient speed and momentum to travel from the conveyor to the passive rollers without coming to a stop on the rollers. For example, after traveling along the conveyor to the passive rollers, the item may travel over the passive rollers and fall off the destination end of the conveyor system that is adjacent to the passive rollers. Workers may be injured by an item falling from the destination end of the conveyor system. Additionally, by falling off the conveyor system, the item or equipment may be damaged.



In accordance with various embodiments of the present disclosure, a roller cover is positioned over and/or adjacent to one or more of the passive rollers. An item on the conveyor system travels along the conveyor, to one or more passive rollers, and then to the roller cover that is positioned over one or more other passive rollers. Due to friction between the item and the roller cover, the travel of the item is restricted along the roller cover. As such, the roller cover may stop the item before it would otherwise fall off the conveyor system. Thus, the roller cover can reduce injury to workers and damage to items and equipment.

In the following discussion, a general description of the system and its components is provided, followed by a discussion of the operation of the same.

With reference to FIG. **1**, shown is a non-limiting example of a conveyor system **100** according to various embodiments of the present disclosure. The conveyor system **100** can move items (not shown), such as packaged or unpackaged products, goods, or any other type of object that is suitable for transport by the conveyor system **100**. The conveyor system **100** is used to transport items into, within, and/or out of an environment. The conveyor system **100** in the embodiment shown in FIG. **1** can be used, for example, at a loading or unloading dock in a fulfillment center. For instance, the conveyor system **100** in the embodiment shown in FIG. **1** can be used to load and/or unload items in a truck or a trailer.

In alternative embodiments, a conveyor system **100** can be located at a manufacturing facility, a warehouse, an airport, a shopping center, or in any other type of environment where it is desirable to transport items from one location to another location. For example, a conveyor system **100** may be located at a retail environment where it is used to move items, such as groceries, at a point of sale station. As another example, a conveyor system **100** may be used to transport luggage into and/or out of inspection systems, airplanes, and/or buildings at the airport. As another non-limiting example, a conveyor system **100** can be used in a manufacturing environment to transport an item being manufactured from one manufacturing station to another manufacturing station. In further embodiments, a conveyor system **100** may be located in a warehouse for transporting items between various storage locations and/or processing stations, for example.

In the embodiment shown in FIG. **1**, the conveyor system **100** includes a driven conveyor section **103** and a passive conveyor section **106**. The driven conveyor section **103** is representative of multiple driven conveyor sections **103** that can be used in a conveyor system **100** according to various embodiments. The driven conveyor section **103** is a portion of the conveyor system **100** that uses supplied drive power to transport an item. For example, the driven conveyor section **103** shown in FIG. **1** includes a conveyor belt **109**. The conveyor system **100** uses power supplied by an external source, such as a drive motor, to move the conveyor belt **109** and thus an item that can be located on the conveyor belt **109**. In alternative embodiments, the driven conveyor section **103** may include a track, a powered roller, a vibrating table, or any other type of conveyor that uses a power drive.

The passive conveyor section **106** is representative of multiple passive conveyor sections **106** that may be used in the conveyor system **100** according to various embodiments. The passive conveyor section **106** is a portion of the conveyor system **100** that facilitates the movement of an item

without the use of a power drive. Such a passive conveyor section **106** may use gravity to facilitate the transportation of an item. For example, according to various embodiments, the passive conveyor section **106** can include, for example but not limited to, a roller, a table, a chute, or any other type of conveyor element that transports items without the use of a power drive. An item can be moved onto the passive conveyor section **106** to, for example, await a worker manually moving the item.

The passive conveyor section **106** in the embodiment shown in FIG. **1** includes multiple rollers. In particular, the passive conveyor section **106** includes a first roller **113**, a second roller **116**, a third roller **119**, and a fourth roller **123**. The first roller **113** is located proximate to the end of the driven conveyor section **103**, and the fourth roller **123** is located proximate to a ledge **126** of the conveyor system **100**. The second roller **116** and the third roller **119** are located between the first roller **113** and the fourth roller **123**, as shown in FIG. **1**.

The first roller **113**, the second roller **116**, the third roller **119**, and the fourth roller **123** facilitate the movement of items along the passive conveyor section **106**. In this regard, the first roller **113**, the second roller **116**, the third roller **119**, and the fourth roller **123** can rotate freely about their respective axes as an item moves along the passive conveyor section **106**. In alternative embodiments, the first roller **113**, the second roller **116**, the third roller **119**, and/or the fourth roller **123** may comprise, for example, a respective row of multiple wheels that can rotate about their respective axes.

The conveyor system **100** in the embodiment shown in FIG. **1** is a telescopic conveyor system. In this regard, one or more portions of the conveyor system **100** can extend and retract in order to adjust the distance that the conveyor system **100** can transport items. For example, the conveyor system **100** shown in FIG. **1** includes a base **129**, a first extension **133**, a second extension **136**, and/or a third extension **139**. The base **129** can be fastened to, for example, the floor, a cart used to move the conveyor system **100**, or any other suitable support structure.

The base **129**, the first extension **133**, the second extension **136**, and/or the third extension **139** may provide support for the conveyor belt **109** and items that ride on the conveyor belt **109**. The first extension **133**, the second extension **136**, and the third extension **139** can also extend and retract with respect to the base **129** and/or with respect to each other. As such, the distance that the conveyor belt **109** can transport items may be adjusted by extending and/or retracting one or more of the first extension **133**, the second extension **136**, and/or the third extension **139**.

The conveyor system **100** shown in FIG. **1** also includes one or more user controls **143**, one or more sensors **146**, one or more lights **149**, and/or other components that are not discussed in detail herein, as they are not necessary for an understanding of embodiments of the disclosure. The user controls **143** facilitate a worker controlling the conveyor system **100**. For example, the user controls **143** may be used to adjust the speed of the conveyor belt **109**, the incline of the conveyor belt **109**, the positions of the first extension **133**, the second extension **136**, and the third extension **139**, and/or other aspects of the conveyor system **100**.

The sensor **146** may detect whether an item is located on the passive conveyor section **106**. In response to detecting that an item is on the passive conveyor section **106**, the sensor **146** may cause the conveyor belt **109** to stop in order to prevent additional items accumulating on the passive conveyor section **106** and pushing the item off of the ledge **126** of the conveyor system **100**.

The light **149** can provide illumination for workers that are in proximity to the conveyor system **100**. For example, if the third extension **139** has been extended into a trailer of a truck, the light **149** may illuminate the interior of the trailer to facilitate the loading and/or unloading of items from the trailer by workers.

Next, a general description of the operation of the various components of the conveyor system **100** is provided. To begin, is it assumed that the first extension **133**, the second extension **136**, and the third extension **139** are set to their desired positions. Additionally, it is assumed that the conveyor system **100** is powered up and that the conveyor belt **109** of the driven conveyor section **103** is moving.

An item can be positioned on the conveyor belt **109**. To this end, a person or a robotic arm, for example, can place the item on the conveyor belt **109**. Once the item has been positioned on the conveyor belt **109**, the item rides on the conveyor belt **109** towards the passive conveyor section **106**.

Upon the item reaching the end of the conveyor belt **109**, the item transitions from the conveyor belt **109** to the first roller **113**. Due to the item making contact with the first roller **113**, the first roller **113** rotates about its axis, thereby facilitating movement of the item across the passive conveyor section **106**. Additionally, a portion of the item may still be on the conveyor belt **109**. As such, the conveyor belt **109** may push the item further onto the passive conveyor section **106**. The item then makes contact with the second roller **116**, the third roller **119**, and/or the fourth roller **123** as it continues moving along the passive conveyor section **106** towards the ledge **126** of the conveyor system **100**. In alternative embodiments, the item may travel across more or fewer rollers.

The sensor **146** may detect that the item is located on or near the passive conveyor section **106** and cause the conveyor belt **109** to stop. In some situations, the item stops while on the first roller **113**, the second roller **116**, the third roller **119**, the fourth roller **123**, and/or the ledge **126**.

However, in some cases, the momentum of the item causes the item to continue moving along the passive conveyor section **106**, over the ledge **126**, and off the conveyor system **100**. Additionally or alternatively, the momentum of another item that is on the conveyor belt **109** and/or the passive conveyor section **106** may cause the other item to bump into the item, thereby causing the item to travel over the ledge **126** and fall off the conveyor system **100**. The item may become damaged as a result of the fall off of the conveyor system **100**. Additionally, the falling item may injure a worker and/or cause damage to equipment near the conveyor system **100**.

With reference to FIG. **2**, shown is the conveyor system **100** equipped with a roller cover **200** according to various embodiments of the present disclosure. As will be described in more detail below, the roller cover **200** can be installed over and/or adjacent to the first roller **113**, the second roller **116**, the third roller **119**, and/or the fourth roller **123** to restrict an item from making contact with at least a portion of the first roller **113**, the second roller **116**, the third roller **119**, and/or the fourth roller **123**. When the roller cover **200** is installed, the item makes contact with the roller cover **200** as it moves across the passive conveyor section **106**. As a result, friction between the item and the roller cover **200** restricts the movement of the item along the passive conveyor section **106**. Thus, the item may stop on the roller cover **200** prior to the item otherwise traveling over the ledge **126** and falling off of the conveyor system **100**.

With reference to FIG. **3**, shown is the roller cover **200** according to various embodiments of the present disclosure.

The roller cover **200** may comprise, for example, aluminum, steel, plastic, and/or any other suitable type of material that increases the friction between an item and the passive conveyor section **106**. In the embodiment shown in FIG. **3**, the roller cover **200** comprises a plate **300**, a first fin **303** that extends from a first side of the plate **300**, and second fin **306** that extends from a second side of the plate **300**. The plate **300** is configured to be positioned over one or more rollers, such as the first roller **113** (FIG. **1**), the second roller **116** (FIG. **1**), the third roller **119** (FIG. **1**), and/or the fourth roller **123** (FIG. **1**). Additionally, the outer surface of the plate **300** is configured to make contact with an item transported using the conveyor system **100** (FIG. **1**).

According to various embodiments, the surface of the plate **300** that contacts an item may comprise various features that increase the friction between the plate **300** and the item. For example, the surface of the plate **300** may comprise protrusions, such as studs, ribs, or other types of members that are configured to increase the amount of friction between the plate **300** and an item transported by the conveyor system **100**. Additionally or alternatively, the plate **300** may comprise a coating configured to increase the amount of friction between the plate **300** and an item. For instance, a rubber coating, a sandpaper coating, and/or any other type of coating may be disposed on the exterior surface of the plate **300**. Additionally, the concentration of the friction coating or feature that is disposed on the plate **300** may vary along various points of the plate **300**. For example, the concentration of protrusions may increase as the distance from the first fin **303** increases. Thus, the plate **300** can comprise a friction gradient for which the friction between the plate **300** and an item increases as the distance to the ledge **126** of the conveyor system **100** decreases.

The first fin **303** is configured to insert between a roller and another element in the conveyor system **100**. For example, the first fin **303** according to various embodiments may insert between the first roller **113** and the end of the conveyor belt **109** (FIG. **1**), between the first roller **113** and the second roller **116**, between the second roller **116** and the third roller **119**, or the third roller **119** and the fourth roller **123**. By inserting between a roller and another element in the conveyor system **100**, the first fin **303** may restrict the roller cover **200** such that the plate **300** is retained in positioned over one or more of the rollers.

The first fin **303** in the embodiment shown in FIG. **3** includes a first section **309**, a second section **313**, and a third section **316**. The first section **309**, the second section **313**, and the third section **316** are respectively oriented so that the first fin **303** forms a shape that can receive a roller, such as the first roller **113**, the second roller **116**, the third roller **119**, or the fourth roller **123**. As such, a roller can be nested within the space between the first fin **303** and the plate **300** when the roller cover **200** is installed in the conveyor system **100**.

Additionally, the first section **309** of the first fin **303** forms a ramp that may facilitate an item moving onto the plate **300**. In this regard, the first section **309** is exposed to and may contact an item that travels from the second roller **116** onto the roller cover **200**. Because of the orientation of the first section **309** with respect to the second roller **116** and the plate **300**, the first section **309** can guide the item onto the plate **300** of the roller cover **200**.

The second fin **306** in the embodiment shown in FIG. **3** is also configured to insert between a roller and another element in the conveyor system **100**. For example, the second fin **306** may insert between the first roller **113** and the second roller **116**, between the second roller **116** and the third roller **119**, between the third roller **119** and the fourth roller **123**, or between the fourth roller **123** and the ledge **126** (FIG. **1**) of the conveyor system **100**. By inserting between a roller and another element in the conveyor system **100**, the second fin **306** may restrict the roller cover **200** such that the plate **300** is retained in position over one or more of the rollers.

The second fin **306** in the embodiment shown in FIG. **3** is angled towards the first fin **303**. With the second fin **306** oriented towards the first fin **303**, the area between the second fin **306** and the plate **300** forms a space that can receive a roller, such as the first roller **113**, the second roller **116**, the third roller **119**, or the fourth roller **123**. As such, a roller can be nested within the space between the second fin **306** and the plate **300** when the roller cover **200** is installed in the conveyor system **100**.

With reference to FIG. **4**, shown is a cross-sectional view of an example of the roller cover **200** installed in the conveyor system **100** (FIG. **1**) according to various embodiments of the present disclosure. In the embodiment shown in FIG. **4**, the first fin **303** has been inserted between the second roller **116**, and the second fin **306** has been inserted between the fourth roller **123** and the ledge **126**.

As shown, the third roller **119** is nested within the space between the first fin **303** and the plate **300**, and the fourth roller **123** is nested within the space between the second fin **306** and the plate **300**. In this position, the first fin **303** in conjunction with the plate **300** clamp onto the third roller **119**. Similarly, the second fin **306** in conjunction with the plate **300** clamp onto the fourth roller **123**. Accordingly, the roller cover **200** is retained in position over the third roller **119** and the fourth roller **123**.

To remove the roller cover **200** from the conveyor system **100**, the roller cover **200** can be pulled away from the third roller **119** and the fourth roller **123**. As the plate **300** moves away from the second roller **116** and the third roller **119**, the first fin **303** and the second fin **306** flex away from the plate **300**. As the plate **300** is moved further away from the third roller **119** and the fourth roller **123**, the first fin **303** and the second fin **306** become separated from the third roller **119** and the fourth roller **123**.

Thus, the roller cover **200** can be installed on a pre-existing conveyor system **100** without the use of bolts, adhesives, or any other type of fastener. Additionally, the roller cover **200** can be removed merely by pulling the roller cover **200** away from the conveyor system **100**. Thus, the roller cover **200** can be installed and removed without making a permanent modification to the conveyor system **100**.

With reference to FIG. **5**, shown is an example of the conveyor system **100** with the roller cover **200** installed. A general description of the operation of the conveyor system **100** with the roller cover **200** installed follows. In the following discussion, is it assumed that the conveyor system **100** is powered up and that the conveyor belt **109** is moving. Additionally, it is assumed that an item has been placed on the conveyor belt **109** and is moving towards the passive conveyor section **106**.

Upon the item reaching the end of the conveyor belt **109**, the item transitions from the conveyor belt **109** to the first roller **113**. Due to the item making contact with the first roller **113**, the first roller **113** rotates about its axis, thereby facilitating movement of the item across the passive conveyor section **106**. Additionally, a portion of the item may still be on the conveyor belt **109**. Thus, the conveyor belt **109** may push the item further onto the passive conveyor section **106**. Thereafter, item makes contact with the second

roller **116**, which rolls to facilitate movement of the item across the passive conveyor section **106**.

The item then makes contact with the roller cover **200**. In particular, the item contacts the first section **309** of the first fin **303**. Because of the slope of the first section **309**, the first section **309** acts as a ramp to facilitate the item moving onto the plate **300** of the roller cover **200**. Additionally, because the slope of the first section **309** of the first fin **303** acts as a ramp for the item, the item may not tumble or tip over upon contacting the roller cover **200**.

The item may continue to move onto the plate **300** of the roller cover **200** and to progress towards the ledge **126** of the conveyor system **100**. Due to the friction between the item and the plate **300** of the roller cover **200**, the speed at which the item is traveling may be reduced. Eventually, the friction between the plate **300** and the item may be sufficient to cause the item to come to a stop on the plate **300** and/or the ledge **126**. Thus, the roller cover **200** restricts the movement of the item on the passive conveyor section **106** of the conveyor system **100**. Additionally, the roller cover **200** may restrict the item from traveling over the ledge **126** and thus off of the conveyor system **100**.

With reference to FIG. **6**, shown is a flowchart that represents an example of the operation of the conveyor system **100** according to various embodiments of the present disclosure. It is understood that the flowchart of FIG. **6** provides merely an example among others of the operation of the conveyor system **100** as described herein. As an alternative, the flowchart of FIG. **6** may be viewed as depicting an example of steps of a method performed by the conveyor system **100** according to one or more embodiments.

Beginning at box **603**, the conveyor system **100** accepts an item on the conveyor belt **109** (FIG. **2**). The item may be positioned on the conveyor belt **109** by a worker or a robotic arm, for example. As shown in box **606**, the conveyor belt **109** is used to transport the item to the first roller **113** (FIG. **2**). When the item arrives at the first roller **113**, the first roller **113** may rotate about its axis to facilitate moving the item across the passive conveyor section **106**. As indicated in box **609**, the item is then transported from the first roller **113** to the second roller **116**. The second roller **116** may also rotate about its axis to facilitate the movement of the item along the passive conveyor section **106**.

Moving to box **613**, the conveyor system **100** then transports the item from the second roller **116** to the roller cover **200** (FIG. **2**). The first section **309** (FIG. **4**) of the first fin **303** (FIG. **4**) of the roller cover **200** may act as a ramp and guide the item onto the plate **300** (FIG. **4**) of the roller cover **200**. As shown at box **616**, the conveyor system **100** uses the roller cover **200** to reduce the speed of the item. In particular, the friction between the roller cover **200** and the item causes the speed of the item to reduce. Thereafter, the process ends.

Although the flowchart of FIG. **6** shows a specific order of execution, it is understood that the order of execution may differ from that which is depicted. For example, the order of execution of two or more boxes in FIG. **6** may be scrambled relative to the order shown. Also, two or more boxes shown in succession in FIG. **6** may be executed concurrently or with partial concurrence. Further, in some embodiments, one or more of the blocks shown in FIG. **6** may be skipped or omitted. It is understood that all such variations are within the scope of the present disclosure.

It is emphasized that the above-described embodiments of the present disclosure are merely possible examples of implementations set forth for a clear understanding of the principles of the disclosure. Many variations and modifications may be made to the above-described embodiment(s) without departing substantially from the spirit and principles of the disclosure. All such modifications and variations are intended to be included herein within the scope of this disclosure and protected by the following claims.

Therefore, the following is claimed:

**1**. A conveyor system, comprising:

a driven conveyor section comprising a conveyor, the conveyor being configured to transport an item to an end of the driven conveyor section;

a passive conveyor section comprising a first roller and a second roller, the first roller being positioned adjacent to the end of the driven conveyor section, the first roller being configured to facilitate the item being transported along at least a portion of the passive conveyor section; and

a roller cover positioned over the second roller, the roller cover being configured to prevent the item from contacting at least a portion of the second roller, the roller cover being configured to restrict a movement of the item along the passive conveyor section.

**2**. The conveyor system of claim **1**, wherein:

the passive conveyor section further comprises a third roller; and

the roller cover is positioned over the third roller so that the roller cover is configured to prevent the item from contacting at least a portion of the third roller.

**3**. The conveyor system of claim **1**, wherein the roller cover clamps onto the passive conveyor section.

**4**. The conveyor system of claim **3**, wherein the roller cover comprises a fin that facilitates the roller cover clamping onto the passive conveyor section.

**5**. The conveyor system of claim **1**, wherein the conveyor system is a telescopic conveyor system.

**6**. The conveyor system of claim **1**, wherein the roller cover comprises a plurality of protrusions that extend from a surface of the roller cover.

**7**. The conveyor system of claim **1**, wherein a surface of the roller cover comprises a coating having a friction gradient that varies along at least a portion of the surface.

**8**. A conveyor system, comprising:

a conveyor comprising a passive roller, the conveyor configured to facilitate an item being moved along at least a portion of the conveyor; and

a roller cover positioned over the passive roller, the roller cover comprising a plate configured to prevent the item from contacting at least a portion of the passive roller to thereby restrict the item from moving.

**9**. The conveyor system of claim **8**, wherein a surface of the plate comprises a coating having a friction gradient that varies along at least a portion of the surface.

**10**. The conveyor system of claim **8**, wherein the roller cover is configured to clamp onto the passive roller.

**11**. The conveyor system of claim **10**, wherein the roller cover comprises a fin that facilitates the roller cover clamping onto the passive roller.

**12**. The conveyor system of claim **8**, wherein the plate comprises a plurality of protrusions extending from the plate.

**13**. The conveyor system of claim **8**, wherein:

the conveyor further comprises an additional passive roller; and

the roller cover is positioned over the passive roller and the additional passive roller.

**14**. The conveyor system of claim **8**, wherein the roller cover further comprises a ramp that is configured to facilitate the item being moved onto the plate.

15. A method, comprising:

positioning a roller cover over a passive roller of a conveyor system, the conveyor system comprising a conveyor;

transporting an item using the conveyor of the conveyor system; and

reducing a speed of the item using the roller cover.

16. The method of claim 15, further comprising attaching the roller cover to the passive roller.

17. The method of claim 15, wherein positioning the roller cover over the passive roller comprises positioning the roller cover over a subset of a plurality of passive rollers of the conveyor system.

18. The method of claim 15, wherein positioning the roller cover over the passive roller comprises disposing the roller cover directly on the passive roller.

19. The method of claim 15, further comprising removing the roller cover from the conveyor system to facilitate the passive roller being used to transport an additional item.

20. The method of claim 15, wherein the roller cover further comprises a fin, and wherein the method further comprises inserting the fin between the passive roller and an additional passive roller.

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